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THE ZOOLOGIST:

A
POPULAR MONTHLY MAGAZINE
OF
NATURAL HISTORY
AND
JOURNAL FOR RECORDING FACTS & ANECDOTES
RELATING TO
QUADRUPEDS, BIRDS, REPTILES, FISHES, ANNELIDES,
INSECTS, WORMS, ZOOPHYTES, &c.
THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

No. CXCV.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price ONE SHILLING.

To Entomologists.

MR. J. C. STEVENS begs to announce that he has received instructions from the Executors of the late GEORGE BROWNELL, Esq., of Liverpool, to Sell by Auction, early in November next, his IMPORTANT COLLECTION of BRITISH LEPIDOPTERA, formed with very great care; it contains series of most of the Rare Species, in the finest possible condition, all well authenticated and mostly named, together with Two first-rate 60-drawer Mahogany Cabinets of Standish's best make, and a smaller one.

Catalogues are preparing, and will be ready for distribution a fortnight before the Sale. (See next Number of the 'Zoologist.')

38, *King Street*, *Covent Garden*, *October*, 1858.

To Naturalists.

ROBERT DUNN, Author of 'The Ornithologist's Guide to Orkney and Shetland,' begs to inform his friends and the public that he has constantly on sale, at moderate prices, properly prepared SKINS and EGGS of all the ORKNEY and SHETLAND BIRDS; also a great variety of other RARE BRITISH EGGS, many of which were recently collected by himself in Iceland.

A list, with prices affixed, will be forwarded, on application (with a postage stamp enclosed) to R. DUNN, Stromness, Orkney.

N.B. Undoubted specimens of Eggs taken in exchange.

To Entomologists.

H. ROGERS, Freshwater, Isle of Wight, has the following INSECTS, in fine condition, for sale:—

Agrotis Lunigera	at 5*s*. 0*d*. each.
" Saucia	" 3*s*. 0*d*. "
" Obelisca	" 1*s*. 0*d*. "
" Corticea	" 6*d*. "
Acontia Luctuosa	" 2*s*. 0*d*. "
Pterophorus Spilodactylus ...	" 2*s*. 0*d*. "
Melitæa Cinxia	" 6*d*. "

And some others at equally moderate prices.

To Ornithologists.

EGGS of BRITISH BIRDS.—A gentleman, having received from the Continent more rare Eggs than he wants for his own Collection, is anxious to dispose of them at very low prices, of which the following are examples:—

Crane	6*s*. 9*d*.
Corn Buzzard	1*s*. 9*d*.
Kite	2*s*. 6*d*.
Great Sedge Warbler	9*d*.
Latham's Pettychaps	6*d*.

A complete list will be sent on receipt of a stamp. Address, C. O. G., 13, Flora Villas, Cliftonville, Brighton.

ant-eater or pangolin (Manis of Linneus), "having no teeth, an extensile tongue, and subsisting on ants and termites; its body, limbs and tail are covered with large, trenchant, imbricated scales, which it elevates in rolling itself into a ball, when wishing to defend itself against an enemy; all its feet have five toes." Such is Cuvier's description of the genus. Ours is a small species (probably Manis brachyurus), measuring *in toto* only two feet and three inches, of which the tail takes one foot. Its gait is most peculiar, — with the body bent in a bow, and the head and tail downwards, as it runs along on the sides of its fore feet. The moment it is touched or molested the head and tail are dragged under the belly, and the animal assumes the appearance of a ball. A live individual was brought to me by a Chinaman with a string tied round one of its hind legs; and to show me the immense muscular strength of the animal, he stood upon its back, and the creature actually raised itself and advanced a few steps. I kept it for some weeks, though when the string was removed from its leg I was at a loss what to do with it, for no box was strong enough to stand its burrowing propensity. At last I inserted it into an overland tin case, and outstood the grating noise produced by the scratching of his long claws on the tin. But it did not hold him long, for though the box was much too high, I thought, for it ever to attempt its escape by forcing the lid, yet this wonderful creature, by supporting itself on the end of its tail, and making use of its claws, managed to get out of the box. I captured him again, tying a piece of whip-cord round his hind leg, it being useless to attempt to bind his retractile neck, secured him under a ladder, with hard tiles to frolic on, and a snug corner to retire into at pleasure. Next morning, however, on paying him a visit, I found he had not contented himself with the snug corner, but had raised one of the tiles, and dragged himself into the earth to the full extent of his string. Without a spade it was impossible to dislodge him, so I let him be; and there he remained for several days without a single morsel of food. At last he left his hiding-place, a good deal thinner, but not much reduced in bodily strength; for that same day with an effort he released his body, and left his bleeding leg behind dangling to the string. The bone of the femur remained on the animal whole, but the flesh had been torn away. He lived for a day or two after this catastrophe, not appearing to pay much attention to his wound, which was fast festering. Strength at last failed him, and he died. The Chinese call this animal, in the Mandarin, the Chuen-shan-kia, or hill burrower, and in the Amoy the Lâ-leé, whence I suppose is

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derived the expression La-lee-t'aôu, applied to a scabby head, in allusion to the bare hairless state of the pangolin's back. Many strange stories are told about this creature by the natives; among the strangest of which is the cunning mode employed in procuring a meal. The artful pangolin, when suffering from the pangs of hunger, rolls himself up, and, erecting his scales, lays bare the naked flesh beneath; in this position he lies for some time, until, attracted by the savory smell of flesh, thousands of mosquitoes swarm on his back to devour; the scales are then simultaneously compressed, and a plentiful meal is shaken out from the fold of his coat of mail, to be relished at leisure by his long tongue. Large prices are given by the native doctors for this animal, as its flesh and bones are employed for various medicinal purposes; and one of its scales, fastened to the end of a stick, is sold as a safe instrument to be used in scratching, without fear of producing ulcers on the skin. So much, then, for the La-lee, on which I have dwelt longer than I should; but, considering its numerous peculiarities, I thought I was justified in saying what little I knew.

Dismissing, then, the Cheiroptera of the Carnaria, with a notice that several species of the genus Vespertilio exist under the venetians and eaves of most of our houses, and may be seen of an evening performing "on giddy wing their gambols round the brook, the tree;" and also the Cetacea, the Phocænæ or porpoises of which order are well known to us even in the harbour, where at times they may be seen showing their round white backs in a line, and then disappearing, to be seen again at a further distance; — let us now turn to the Aves, at which class we must take a much more general glance, as their numbers are much greater than the Mammals; for there are certain spots on the earth's surface where the latter are seldom, if ever, seen; but, possessed of such various locomotive powers, the former are found in all parts of the globe. We commence, then, with the Raptores. Of the true Falconidæ, the species indigenous to Amoy is the Falco tinnunculoides, also found in Europe. The peregrine falcon (*Falco peregrinus*) is a straggling visitor, but a pair built their eyrie last year on the high hill of Nan-tai-woo (on the summit of which stands the pagoda), and some Chinese, who had robbed the nest, exposed the young birds (little balls of white down, with long yellow claws and noble black eyes) in the market for sale as young kites. I readily purchased them, and kept them in confinement for some time, and had the pleasure of watching the gradual casting off of the white down, and development of feathers. Their erect posture, piercing glance, and superior size,— who that has once seen can ever mistake the peregrine?

A species of sparrowhawk (*Accipiter*), differing principally from that bird in England in having white instead of red axillary coverts, makes an occasional tour in the vicinity. There is also a buzzard (*Buteo*), and the hen harrier (*Circus cyaneus*) of Britain is seen not unfrequently in the early winter.

The kite, or Bah-heò, pronounced Nai-heò in the Chang-chow district (*Milvus Govinda*), the scavenger of the harbour, comes next. At all hours of the day he may be seen floating in numbers over the tall masts of the ships, uttering his well-known scream. Some offal on the surface of the water catches his eye; he descends and bears it away, perhaps pursued by several others, to some favourite rock, where, having driven off his pursuers, he quietly tears and swallows his morsel. An arrant coward, too, is this self-same kite. A crow or a magpie is often seen to attack him when he approaches the vicinity of their nests, and the ignoble bird of prey retreats at once, with piteous cries, at every attack of his assailant offering his hooked claws, but making no further resistance. Among themselves in the breeding-season they fight a good deal, but never come to an earnest set-to; it is always pounce, offer claws, scream, and fly away. Once, by some mismanagement in this mode of fighting, I saw a pair hook claws, and at claws' length spin round and round, not being able to extricate themselves till they reached the ground. They build in great numbers on the precipitate sides of the Pagoda Island, and one pair had the temerity to nestle on the top of the ruins of the half-fallen pagoda, but at the same time had the good sense to place their nest on the side least exposed. I discovered no less than six nests in an evening's stroll on the island; they were built of twigs, roots, pieces of rag or paper, or in fact any available rubbish, sometimes lined with a few feathers. Their eggs are nearly round, as big as a good-sized hen's egg, and blotched with olive-brown. In an evening at sunset I have counted as many as sixty kites, soaring at different heights over that island.

An osprey (*Pandion*) is sometimes seen even in the harbour, but little is known of him. I have seen him strike a fish close under the bows of a vessel, and bear it away in triumph.

The great owl (*Bubo maximus*), Am-kong-cheáou, I have seen twice, but have been assured by the priest of the Nam-p‘o-t‘o temple, that in rainy seasons he has shot (he sports a foreign gun) several specimens. I reared a young one, and kept him for more than two years; by some accident in the beginning of his career he had one of his eyes knocked out, when the other orb seemed to increase in size and lustre, and make up somewhat for the lost eye. The iris was of a dark golden yellow; but his great cat-like head, with long feathery horns, which he always erected when irritated,—his loud snap of the bill and hiss of alarm, and flap of his expansive wings, used to be the admiration of all who saw him. In very hot weather he used to shake the skin of his throat with mouth open, in the same manner as turkeys do.

A sparrow owl (*Nyctipetes,* Swain.), and a small tawny Scops owl (probably Scops rufescens of Horsfield), are seen occasionally in winter.

We will pass more rapidly now through the next and most extensive order, that of the perchers (Insessores), and I will only make slight mention of a few of the species that are strictly indigenous to Amoy. At their head stands the large butcher bird, or shrike (*Lanius,* Schach), nearly always to be met with in the valleys, uttering his discordant cries. It is the Pe-ló of the natives.

Among the Merulidæ, or thrushes, the blackbird and rock thrush (*Petrocincla violacea*) are always with us, the former enlivening our gardens by his rich full notes, and the latter enchanting the lonely wanderer among the bleak hills with his wild minstrelsy, as he sings from the summit of a monstrous boulder, or springs lightly into the air, trolling forth his merry roundelay. It may be mentioned that the blackbird here, though very similar, is yet not the same as our blackbird at home; he differs not only in being of greater size, and in the colouring of the female, but also in his call-note. The rock thrush and blackbird are taken by the Chinese for one and the same, and are called Ok'ee, though one is blue and red, and the other black.

The most familiar and perhaps best known is the magpie robin (*Gryllivora*), a small bird of the pied plumage of a magpie, with the habits and peculiarities of a robin. Its song, poured out at early morn or sunset from the roof-tops of our houses, is occasionally pretty, but abounding in harsh and jarring notes. Like the redbreast at home, it is very quarrelsome, and sings in defiance when engaged in duels with others of its tribe; but few engagements prove mortal, except in the pairing season, when it is not uncommon to find the defeated gallants skulking about, and seeking for holes that may suffice them at once for deathbed and coffin. Its native name is Sze-he, which means "resembling the magpie," and it is here vulgarly called Chúy-k'am-ch'e.

The most diminutive of all stands next, the little tailor bird (*Orthotomus*), remarkable for its long pointed bill, which serves as a needle in sewing leaves together round its nest; the under side of a long leaf of the Alpinia nutans is often chosen, the edges of which are drawn together by thread made of spider's web and fibres. The prettiest construction of the kind I have seen was a nest flanked in by three orange-leaves, and placed at the extremity of the bough of an orange tree. This bird is called Mang-tang-á in the vernacular.

A genus of long-tailed birds, closely allied to the last, is found wherever bushes abound, the longtails (or Priniæ). Their song is sweet, but never varied.

The Zosterops, white or mealy eye, Fun-yen and Chi^{n}-si-á, little green and yellow birds, with a peculiar ring of white feathers round the eye; and a species of tomtit (*Parus*) may be met with all the year through.

Time would not suffice were I to give separate remarks on each indigenous species. I must not, however, pass over a very singular bird of the tribe Tenuirostres, by no means uncommon in Amoy, and which cannot help attracting notice by its gay colours and peculiar form; I mean the hoopoe (*Upupa Epops* of Linneus), also found in Europe, and a rare straggler in Great Britain. It is a bird of a buff-fawn colour, striped transversely with black, and adorned with a beautiful crest of long lax feathers, banded alternately with red and black, which he is capable of raising or depressing at pleasure. The awkward gait of the bird; its occasional tapping on the ground with its long bill, as if with a walking-stick; and its singular habit of bowing when disturbed, would of themselves make the creature an object of interest; but what is most peculiar is its cry of *hoo-poo-poo* (whence its name), produced by drawing the air into the trachea, which puffs out on each side of his neck, and forcing it out again by striking the point of his bill against the ground, each stroke producing a separate and distinct note. It is looked upon with some aversion by the Chinese, on account of its often selecting dilapidated coffins to nestle in, and is nicknamed by them the coffin-bird. I have found the nest in an exposed coffin, as also in the city wall. The young are very timid, and make a strange hissing noise when crying for food.

The Ardeadæ, or herons, as might be expected from the large tracts of paddy fields, abound in their species, prominent among which stands the heron of Great Britain (*Ardea cinerea*), also found here. Flocks of the beautiful white egret, or paddy bird, as they are familiarly known to us (*Herodias Garzetta*), often attract our attention as they wing their way slowly through the obscure blue of a summer twilight, from the fields where they have been feeding, to their selected nest-trees, on which they settle like masses of snow among the dark green leaves.

The yellow-headed egret, while with us in summer, is commoner, and roams about in larger flocks than the latter. A third and solitary species, Herodias flavirostris, is also found, and may be distinguished by its yellow bill, and the tuft of snowy feathers which surmounts the occiput. We have, besides, five or six other species of heron, nearly all remarkable for their elegance and beauty. The egret is much admired by the sentimental Chinese, and is often alluded to in poetical compositions by the style Loo-sze; and the Island of Amoy is often poetically called Loo-mun, Loo-keang, and Loo-taon, from the number of these snow-like birds that annually frequent it.

Of the ninety-two species of Insessores found here, nine are British birds. Seven species of the Grallatores, and nearly all the Natatores, with the exception of the pelicans, albatrosses, and a few gulls and terns, are identical with those found in Great Britain; and again, many forms that exist in Europe, though not discoverable here, are represented by very similar and closely-allied forms.

I think here, for the present, I may close my remarks on the Fauna of Amoy, without proceeding to discuss the Reptilia, Pisces and Insecta, as it would require a person much more thoroughly versed in Natural History than myself to undertake it.

It is unnecessary to dilate on the beauties and delights of the study of Nature: the heart of every man naturally throbs in the contemplation of the Creator's handiwork, and thrills with joy at the discovery of some new manœuvre in the wondrous economy which so beautifully modulates and arranges all animal and vegetable life upon the globe. Solomon said, "There is nothing new under the sun;" so, probably, there is not; but a great deal of what passes around man is new to him, and astonishes him when brought to his notice, simply because he has not made use of those powers of observation that he has been endowed with.

In conclusion, I cannot do better than quote the words that Milton puts in the mouth of the Divine Author of Nature in his address to our first parent:—

> "Is not the earth
> With various living creatures, and the air,
> Replenish'd; and all these at thy command,
> To come and play before thee? Know'st thou not
> Their language and their ways? They also know,
> And reason not contemptibly. With these
> Find pastime."

ROBERT SWINHOE.

Amoy.

On Marine Mollusca in Aquaria.

By CHARLES BRETHERTON, Esq.

THE Mollusca are, generally speaking, ill adapted for the purposes of ordinary aquarians. Though many are equal in beauty to the handsomest zoophytes, the difficulty of preserving them has effectually prevented their becoming popular. Many require particular attention or accommodation different from that of an ordinary tank; and as a group their habits are but little interesting, and their actions monotonous. To those who devote themselves to the study of the Mollusca, the use of the aquarium is almost indispensable: it is impossible to observe accurately their forms, except in their native element, and in the small species this is a work requiring continued study. To learn their habits and follow their metamorphoses the aquarium is still more necessary.

Observations on animals in aquaria usually consist of notes on their peculiarities of habits, but shell-fish afford very little matter of this kind, on account of the great uniformity and similarity that prevails among them in this respect. Like all marine animals, they require a twofold sort of attention: in the first place, they require that the conditions under which they naturally exist should be in some measure reproduced in confinement; and secondly, proper food. Most shell-fish can be kept either in a vessel with sea-weed, and a bottom of shingle or stone, or in one with a deep bottom of pure sand. It is not advisable to combine the two, though often recommended. An ordinary aquarium with a layer of sand at the bottom is more difficult to keep clean, and never looks so well as one with shingle or gravel. As a general rule, univalves should be kept on rock, bivalves in sand. As to food, the bivalves and tunicaries are infusorial feeders, and require no attention whatever; the plant-eating univalves find food for themselves in any ordinary aquarium, though some have particular tastes; and the carnivorous univalves have to be supplied with appropriate food, consisting very frequently of their bivalve relatives. The latter are evidently the most troublesome to keep.

Purpura Lapillus, our commonest muricidal animal, is as easily preserved as procured. It is a hardy mollusk, and will live without food for more than a month. It should be fed with mussels, a small-sized one, an inch or an inch and a half long, being given every week. They seem to form its habitual food. I have kept it with oysters, Modiolas and periwinkles, but it has never molested them. It perforates and devours its victim in two or three days. The perforation is more or less rounded, about $\frac{1}{15}$th of an inch in diameter, and, as the outer layer of the shell is more rasped away than the inner, somewhat funnel-shaped. The proboscis is inserted through the hole, and attenuated for that purpose; it varies in thickness accordingly as it is more or less elongated. I have seen it inserted. This shell-fish is shy, and not very active in its habits, and becomes more than usually sluggish when kept without food. It will oviposit in confinement, but some capsules deposited in March were not developed in July, when they were unintentionally destroyed.

I have never fed any of the other Muricidæ. Some can be more easily kept than others; thus, Fusus antiquus is much more active and hardier than Buccinum undatum.

Natica monilifera belongs to quite a different group of Gasteropoda, the sand-inhabiting mentiferous tribes. It lives well if kept in sand and supplied with food, but cannot endure privation of food. It lives buried, and seldom shows itself. It can crawl quickly over the sand, and pursues in it the bivalves, killing and devouring those it can detain in the grasp of its large and flexible foot, which it uses as an organ of prehension. It can kill those the size of a cockle or a little larger, but a full-sized M. solida is too strong for it, and can live with it with impunity. Cockles do very well to feed it with, as they are easily procured, but other bivalves seem to be more to its taste. It always devours its prey buried in the sand. If it captures it on the surface, it buries itself with it. A cockle once a week is sufficient. It will also devour, in aquaria, small M. solida and Mactra stultorum, Tellina solidula and Donax anatinus. I have tried to feed it with mussels, and observed it exsert its proboscis and touch them; but it always left them afterwards, without boring. The holes it makes are rather larger than those of the Purpura, but of the same shape and appearance; they are usually through the umbone.

In a cockle there is one on the umbone carried through but not completed, and another, completed, towards the middle of the valve; in a Donax it is of irregular shape, and on the hinge-line between the valves. The Natica maintains communication with the surface, when buried in the sand, by a good-sized hole, that probably communicates with the branchial chamber on the left side. When creeping above the sand, the left posterior angle of the mentum is raised so as to admit the water to the gills. The tentacles are but little developed, and laid back against the shell when the animal is first exserted, but when it becomes more familiarised with its situation they stand erect, of considerable length, arcuate, with their convexity forwards. The drawing in the 'British Mollusca,' by Mr. Spence Bate, is mostly incorrect; Arthur Adams has drawn it better, but, as in other figures of his, the animal seems somewhat contorted. The mouth is provided with two horny jaws, of the same character as that of Triton, figured in the 'Manual of the Mollusca:' they are irregularly triangular, striate, with one side strongly serrated. The lingual ribbon is less than a third of an inch in length. The jaws are horny brown, the buccal mass red, the proboscis white; the latter, when exserted, seems rather thick, but must be capable of attenuation to pass through the small holes it makes. Though it devours its victims pretty completely, there is always some animal matter left, which blackens all the sand round it when it decays. Unless the shells are removed as soon as the Natica leaves them, the sand in which it is kept becomes after a while unfit for use. The former expedient is difficult to adopt, as the only indications of an animal's death are the disappearance of its siphons, and the presence of the Natica in its neighbourhood. Natica can creep up the glass, but does not adhere firmly; it leaves a slimy trail.

Turbonilla, *Loven*. These minute animals afford strong proof of the utility of the aquarium to the working student. Speaking of the difficulties of, and perseverance required in, the observation of these little creatures, Mr. Clark says they must be studied "with a regular supply of fresh specimens, as torpidity always ensues in less than twenty-four hours." As far as my own limited experience extends, they will remain lively in the aquarium for at least a month or so. I can confirm his statement that T. (Chemnitzia) pusilla has the foot produced behind and pointed, while T. (Chemnitzia) elegantissima is said to have it rounded behind and shorter. It creeps quickly over the sand and glass, but very frequently falls off the latter. The shell is dragged rather than borne; the mentum is carried in the same position as the head of Rissoa,—it is narrower than, and carried in advance of, the foot. Clark, and Gray after him, call the mentum the head; but, as the former himself says the proboscis issues under the tentacles and above the mentum, it does not seem likely that it really is so. I have never seen the proboscis exserted.

Capulus hungaricus, contrary to what might be expected from its sedentary habits, could move for a few inches even on the smooth erect sides of a glass jar. The proboscis or rostrum (like that of Cypræa, it seems to be of an intermediate character) is capable of extension, and can be produced beyond the shell. I have not succeeded in preserving it for any length of time. Like most of its relatives, its habits and food are very imperfectly understood.

Hydrobia Ulvæ. It is difficult to place much confidence in drawings of animals of the Mollusca, when we find this common and easily-observed mollusk most incorrectly represented, both in the 'British Mollusca' and in the 'Genera of Shells.' Besides incorrectness of proportion, which it is not easy to specify with accuracy, both Forbes and A. Adams have made the foot triangular and pointed behind, instead of oblong and obtusely rounded; they also make the opercular lobe narrower than the foot, instead of extending over the sides as in Bithinia. Adams has also given the rostrum a curious twist upwards. The emargination of the rostrum is caused by the retraction of the buccal mass, and disappears when it is applied to any surface; it then has a slightly globular or inflated appearance. In the text of the 'British Mollusca' the foot is correctly described. There is a distinct marginal groove across the front edge of the foot, which does not extend quite to the tips of the auricles. The foot is thus bilabiate, or provided with a linear duplication as in Littorina. There is a curious and easily observable process or fillet issuing from the anal angle of the aperture, the use of which is unknown. The male organ is in the usual place, falcate, compressed, lead-blue sprinkled with yellow. The fœcal pellets are oval, brown, often clustered; they have not bred in confinement, though they grow to a very large size, some being as much as one-third of an inch in length. Clean specimens have the shells chestnut-brown, lighter near the sutures. When taken on the shore they are of a dark brownish green, and hardly half of the size they attain in confinement. The young have the shell more or less translucent, and the animal colourless; the black bars on the tentacles appear first as a sprinkling of black dots. The buccal mass is, I believe, always coloured red. They are abundant on the grassy weed on the stones in sandy places in spring.

Gosse says that Rissoæ (including this species) are precarious, but I have not found them so. They eat Confervæ and weed, like periwinkles in confinement, but they are often found in abundance on sand-banks where there is no weed at all. They creep with ease over sand, rock and glass: most shell-fish that inhabit sand adhere very imperfectly to stone and glass, but this is not the case with this species.

Littorina. The common periwinkle is often recommended as a scavenger in the same mode as the fresh-water snails. The very insufficient cleaning they bestow on the sides is generally far more than compensated by the amount of weed they destroy. Though so often kept, this periwinkle does not seem to breed in confinement, and its spawn is little known. The viviparous species breed freely: L. saxatilis, one of the varieties of L. rudis, began to breed in January. The young have chestnut-brown shells and white animals: the signs of immaturity are the uniform thickness of the tentacles and their bluntness, the large size of the head in proportion to the foot, and the distinctness of the eyes. These little periwinkles do very well in the aquarium, as they are prettily marked and hardy. They require to be closely covered, as they often creep out of the water, and attach themselves by a sticky exudation. They are here found in the highest part of the littoral zone, or rather high up on a light-house in the lower part of the littoral zone.

Nudibranchs are noted for what is called their delicacy of constitution. The real difficulty in keeping them is to supply them with appropriate food. A Doris will dwindle away to half its original size before it will give up the ghost: they die from starvation. Doris pilosa is hardier than D. bilamellata, and some of the small species seem to live still better. I never kept one more than two months, but I never paid them proper attention. They feed on Bryozoa and small zoophytes, and spawn in spring and autumn. The spawn of D. pilosa is developed in a few days. The free-swimming larvæ all die away before casting their shells; they cluster about the surface of the water in considerable numbers. They are often compared to Pteropoda, but their lobes or wings are not moveable, and their easy gliding motion is caused by ciliary and not muscular action. Though so very minute, their peculiar motion enables them to be distinguished by the naked eye. The free-swimming larvæ of barnacles can be distinguished in the same manner.

Eolis papillosa creeps very quickly, and is lively in its habits. It is fond of squeezing its flaccid body into crevices and narrow places. I have fed it with anemones. One, two and a half inches, ate every week an Actinoloba Dianthus about an inch in diameter. The tube on the right side of the body can be exserted to some length.

Cylichna obtusa. These animals live in sand, moving about slowly, with the head, disk and fore part of the shell buried, and leaving a very distinct trail. They feed on Hydrobiæ, which abound on the sand-banks where the Cylichnæ are found. They can crawl on glass and stone as well as through the sand, but the least obstacle causes them to lose their hold and fall. They progress by pushing forward the foot, and then drawing the shell after it. Unlike the larger species of the same genus, the tongue seems to be unarmed. I have not found them do well in aquaria.

Chitons live well in confinement. It is not known exactly what they feed upon, but I have noticed the common Chiton scrape the glass like a periwinkle. The appearance of the tongue when in action is very peculiar, resembling the opening and closing of a fan. They creep about freely, but their motion is slow. A small specimen of Chiton cinereus, nearly white, has not grown during a year's confinement. Mollusca very frequently become stunted in aquaria, from want of sufficient nourishment. It is very frequently the case with fresh-water snails, which sometimes also become distorted.

Bivalves are less interesting than univalves in aquaria; an accurate examination of a bivalve, moreover, cannot be made without destroying, to observe, the branchiæ and palpi. They generally live very well, and as they require no feeding they are very little trouble to keep. Some require a deep bottom of fine sand, and others do well in an ordinary tank.

The oyster is one of the latter class, and, as it is probably the hardiest of bivalves, it is very suitable for keeping an ordinary tank free from the spores of the weeds, — a service for which the presence of some Acephalæ is indispensable. Mussels may be used for the same purpose, and if handsome specimens are selected they are more ornamental than oysters, though not so hardy. Young mussels are often abundant on whelk. The siphonal apertures are at first plain-margined, and, in the very young, ciliate; the branchial one afterwards becomes laciniate, and as they advance in age the laciniations become more and more complicated. The mantle is more protruded than in the adult, and the terminal character of the umbone less marked. They are more active than the mature ones. Like all byssiferous bivalves, they can detach their byssus and move about. When the water is insufficiently aërated they usually move to the surface. Their track is marked by the detached threads they spin to assist them in climbing.

Modiola Modiolus I have found hardier than the mussel and more sedentary. They seldom, if ever, move from where they are placed. The mantle is of a dirty brown with white spots, and its margins are plain; the anal siphon is distinct from the branchial, and has sometimes a laterally-compressed conical appearance.

Crenella marmorata can be easily kept, and its siphonal developments are rather peculiar: the anal siphon is tubular, and can be protruded nearly as long as the shell; the branchial gape extends from half-way up the anal siphon to the middle of the ventral range, opening wide enough to show the branchiæ; the two margins of the mantle that form it are plain and often much protruded. The foot can be drawn out to twice or thrice the length of the shell. The siphons are white tinged with purplish red. They are active and lively animals, and often conceal themselves in crevices or tufts of weed. They do not seem to suffer from being cut out of the tests of Ascidiæ: my specimens were obtained in this manner.

The habits of the sand bivalves, Mactra, Tellina, &c., are all similar, and they require to be kept in the same way, viz., in a bottom of pure sand. They seldom move when once buried. I have preserved several species without difficulty, but, as they show nothing but the tips of their siphons, they are not very interesting. The siphons of bivalves vary much in length, but they are often figured and described as shorter than they usually are. Cockles do not bury so readily as the others, and their short siphons oblige them to keep near the surface. Tellina solidula has a peculiar habit of writhing the inhalent siphon, and touching the surface of the sand with its tip, sucking in small particles, which can be seen through the translucent tube. T. tenuis seems to be destitute of this peculiarity. Young tapes will suspend themselves to the glass sides like young mussels.

Saxicava lives well, but is liable to be stifled by the thick, matted and slimy Confervæ often common in long-established aquaria. They either live uncovered, or bury themselves in the shingle. The siphons of S. rugosa are generally nearly as long as the shell. When the Confervæ gathers round them they are entirely retracted, and the animal soon dies. Saxicava possesses limited powers of locomotion.

Pholades are best preserved unburied, and will live very well, though never found so naturally; but if kept in the same vessel with crabs or other voracious animals, the latter soon destroy them. They cannot move. The siphons vary in shape; their adventitious covering falls off in confinement, and they become white. Most bivalves live naturally in a vertical position, and when Saxicava and Pholas are kept unburied and horizontal they curve their siphons with the orifices upwards. The foot can be a little exserted and moved. It seems that none of the bivalves that bore in rock or other hard substances can form a new dwelling if removed.

Ascidiæ and Cynthiæ can be preserved in ordinary aquaria, but the former require to be kept clean and free from Confervæ, and they soon die if they get foul. Cynthiæ are not injured by dirt.

CHARLES BRETHERTON.

47, Hamilton Square, Birkenhead,
August 23, 1858.

Occurrence of Actinia gemmacea at Weymouth.—It may be interesting to the readers of the 'Zoologist' to know that I obtain Actinia gemmacea (Haliaëtis gemmacea, *mihi.*, in 'Zoological Proceedings'), on this coast; they are not in very large numbers, and are of a lovely colour, far brighter than the Devonshire specimens. My man brought me eighteen on Saturday last. I do not particularize the spot further than by saying it is within four miles of Weymouth, inasmuch as I am sorry to say that in this part there is a system of extermination carried on by visitors, and to which Asplenium marinum and Actinia clavata have already fallen victims, and even Anthea cereus and Actinia Mesembryanthemum are becoming rare; hence I intend for the future to keep exact localities to myself, not from selfishness, but simply from a well-grounded fear of extirpation.—*William Thompson; Weymouth, August* 30, 1858.

Note on the Pertinacity of the Spotted Flycatcher in its choice of a place for Nidification.—About the end of June last, a spotted flycatcher began to build a nest over the door of the lodge at the entrance of my grounds. The woman who lives in the lodge, not wishing the bird to build there, destroyed the commencement of the nest: every day for a week the bird placed new materials on the same ledge over the door, and every day the woman removed them, and, at the end of the week, placed a stone on the ledge, which effectually baffled the flycatcher's efforts at that spot; but the bird then began building at the latter end of the ledge, from whence it was also driven away, and, three stones being then placed on the ledge, the bird relinquished the attempt to build at either end of it, and commenced building a nest on a beech-tree opposite, which it completed, and laid two eggs in it. When the bird was thus apparently established in the beech-tree, the stones over the door were taken away, when the flycatcher immediately forsook its nest and eggs in the beech, and again commenced building over the door, on the part of the projecting ledge which it had first chosen. The nest was again destroyed, and two slates placed over the spot; the bird contrived to throw down one of the slates from a slanting to a horizontal position, and then began to build upon it. The nest was again destroyed, and the three stones replaced and kept there a fortnight, after which they were again removed, and directly they were taken away the bird again began building. The nest was subsequently destroyed several times in succession; the bird was twice driven away by a towel being thrown at it; a stone wrapped in white paper was placed on the ledge to intimidate it, but the flycatcher still persevered, completed a nest and laid an egg. On hearing the circumstance I directed that the persecution of the poor bird should cease, after which it laid two more eggs, hatched all three, and successfully brought off its brood.—*J. H. Gurney; Catton Hall, Norwich, September* 10, 1858.

Motacilla campestris and M. boarula.—I write in order to notice a somewhat singular circumstance respecting the Ornithology of this district. Until the year 1855 a common species in this neighbourhood was Ray's wagtail (*Motacilla campestris*), being found extensively both on the verge of the moor-land near Richmond, and also in the corn and ploughed fields. The gray wagtail (*Motacilla boarula*), on the other hand, was by no means abundant, notwithstanding that the rocky banks of the river Swale were well adapted for the nidification of this species. For the last three years, however, the case has been exactly reversed; Ray's wagtail has visited us each year in gradually decreasing numbers, until this season (1858) I have only observed two pairs, whilst dozens of M. boarula are to be found within a short distance of the town. It has been suggested that the enclosure and cultivation of some waste land, which they formerly greatly frequented, may have partly caused their retreat; this reason can, I think, however, hardly hold good, since, in some other districts, the birds appear to select cultivated land in preference to that which lies waste, and, although deprived of it here in one instance, there is of course plenty of moor-land to which they could still betake themselves.—*Henry Smurthwaite; Richmond, Yorkshire, September* 4, 1858.

Emberiza nivalis.—Having lately returned from North America, where I had frequent opportunities, during the winter, of observing the habits of the snow bunting, I am glad to have it in my power to corroborate Mr. Mathews's assertion as to its perching on trees, and his remark (Zool. 6208), "and if I persisted in following it up, would at last fly off and alight on the hedge, or else on one of the trees," is exactly similar to what I have noticed; for, when either much disturbed or fired at, they would occasionally leave the stubble in large flocks and fly into the neighbouring trees, which then appeared as if clothed with white foliage. They were more than once shot, both by myself and sons when thus settled among the branches: moreover, they cannot only perch on "low broad railings" as stated by Mr. Doubleday (Zool. 6094), but on the small twigs of the topmost branches. The same writer further observes, "that the pure black and white plumage is their summer livery." Not having been in the Arctic Regions, where this species is said to breed and pass the summer (North America being its winter quarters only), I cannot undertake to say what the plumage may be at that season, but I think Mr. Doubleday's description of it, "pure black and white," is far more like that of the snow bird (*Fringilla nivalis*), than that of Emberiza nivalis. He quotes Mr. Selby, who says the snow buntings "never perch on trees," to prove his own assertion, "in no instance have I ever seen one attempt to perch on a bush or tree." Probably Mr. Selby may have seen but occasional stragglers, and those in an open country where no trees were at hand, for, had he visited North America, he could not have failed to have observed what I have above described. It only shows how cautious we ought to be before pronouncing a decided opinion on the habits of birds that only occasionally fall under our notice. Mr. Abraham, of Kingston, Canada West, a very intelligent bird-stuffer (to whom I was more than once indebted for information), had a caged snow bunting which constantly made use of the perch. As to the editorial query (Zool. 6094), "Was the pied flycatcher the bird that he saw?" I should say decidedly not, for the following reasons:—In the first place, I must notice their great dissimilarity in size; for the pied flycatcher, according to Macgillivray, measures but $5\frac{1}{4}$ inches in length, and 8 inches in extent of wings; whereas the snow bunting, according to the same author, is $6\frac{7}{12}$ inches in length, and 13 inches in extent of wings.* Secondly, the two birds are of a totally different shape, if not colour. Thirdly, a turnip-field is not a likely place, I should say, for the pied flycatcher to resort. Fourthly, the habits of the latter bird, differing so widely from those of the skylark, it is very improbable that they should associate. Fifthly, Montagu says, "This bird (the pied flycatcher), rarely if ever makes its appearance in the southern parts of the island." Sixthly, Macgillivray states, that "the pied flycatcher, which like the gray, is a summer bird in Britain, arrives from the middle to the end of April." But enough, I think, has been said to prove that it could not have been the pied flycatcher that was observed by Mr. Mathews, in January last. Had I reason to doubt its being the snow bunting I should be more inclined to set it down as either a female, or immature male, of the Lapland bunting (*Emberiza calcarata*), which is about the same size, and not very dissimilar in colour, for Temminck, tells us (vol. i. p. 323), "La fémelle a le sommet de la tête, le cou, le manteau et le dos d'un cendré roux avec des taches noires; une bande d'un blanc roussâtre suit la même direction comme chez le mâle; elle se réunit avec un trait blanc qui part de l'angle du bec; gorge blanche, bordée latéralement par une bande brune; la poitrine marquée de nombreuses taches grises et noires; les autres parties inférieures blanches; des taches longitudinales sur les flancs." According to the Prince of Musignano and Dr. Richardson, the Lapland bunting "frequently intermingles with larks."—*Henry W. Hadfield; Elgin, N.B., September* 8, 1858.

Another talking Canary.—Mr. Sotheby relates, in the 'Zoological Proceedings,' some particulars of a canary whose conversational powers made an approach to those of the little bird which, a few years ago, proved so attractive an exhibition in Regent Street. This bird was the only one hatched out of a nest of four eggs, and was forsaken immediately on escaping from the egg-shell; it was found nearly dead in the nest, placed by the fire in flannel, eventually restored to life and health, and brought up by hand. Separated completely from all other birds it became familiar with those who fed it. Its singing notes were totally different from those of a canary: at three months old it repeated the words "Kissie, kissie," and imitated the sound of kissing; and afterwards for hours together repeated "Dear, sweet Titchie; Kiss Minnie; Kiss me then dear Minnie; Sweet, pretty little Titchie," &c.: it also whistles the first bar of "God save the Queen," and imitates the sound of a dog-whistle occasionally used about the house. The object of my quoting these particulars is to throw an additional ray of light on that highly interesting subject, the natural source of instruction in song-birds: the facts recorded by Mr. Sotheby seem to show that song in birds, as in human beings, is entirely educational.—*Edward Newman.*

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* One shot by me on the 29th of October, 1857, measured $6\frac{1}{2}$ inches in length, and 12 inches in extent of wings.

Nidification of Swallows.—Since my return from Canada, I have perused with some interest (Zool. 5755) Mr. Slaney's novel plan for ridding himself and others of the "nuisance so often complained of,"—*i.e.* the "procreant cradles," or nests of the martins, placed in the window-sills, and driving them from the dwelling-houses to the stables, and other out-buildings. Were these latter buildings generally like those of Hatton Hall this plan might possibly succeed, but we know the reverse of this to be the case, and that such buildings, for the most part, are of no considerable elevation, and with few or no windows, consequently totally unsuited to receive the nest of the martin, as designed by Mr. Slaney. Moreover, it is to be hoped there are still some few among us who would be inclined to pause before proceeding to carry out this sweeping or radical reform, which, if successful, would have the effect of driving this "confiding social bird," "the poor swallow," "this most harmless and interesting visitor, whose confidence in man's protection but too often leads to its own destruction," from the dwelling-house to the stable. This appears a somewhat cool and inhospitable way of treating "our generally welcomed guests,"—besides many persons might, I think, miss "the constant twittering and noise made during the breeding-season." However, it might be fairly asked, What better plan have you to suggest? I must confess that I know of none, unless our "zealous, officious and remorseless housemaids" could be taught to respect the nest of the martin, as they do that of the more fortunately favoured robin; but how that change is to be brought about I am rather puzzled to conjecture, unless the originator of this well-meant scheme would either indite some pathetic tale or parody the 'Babes in the Wood,' which possibly might touch the hearts of some of the young "remorseless housemaids," but as to the old maids, whose hearts and feelings may be blunted, and not likely to be worked on or affected by either poetry or prose, I would suggest for them that they be duly admonished by their lords and masters, and moreover made thoroughly to understand that for the future no inversion of the broom-handle will be allowed or even tolerated, but that the staff of this most necessary household implement must be strictly confined to its destined use. I also observe in the 'Zoologist' (Zool. 5790) an article on the same subject by Mr. R. Smith, in which the following passage occurs:—"But yet I think it should be recorded, that in one instance, to my certain knowledge, a swallow did construct its nest in such a position,"—*i.e.* under the eaves. "The nest seemed very rickety, and loosely attached to the sill, and, unlike the martin's nest, the top was not attached to any part of the projecting eaves, there being a space of about three inches between the two, by which the old bird made its entrance." In confirmation of Mr. Smith's assertion, and in reply to the editorial query at the foot of the page (Zool. 5756), "Does not the writer Mr. W. Slaney refer exclusively to martins?" I beg to transcribe (having nothing to offer of my own) a few lines in elucidation of the subject from the work of the late Professor Macgillivray, vol. iii. p. 567, Hirundo rustica:—"The materials of which the nest is composed, as well as its form, vary according to circumstances. Thus, in August, 1834, I observed several nests of this species stuck beneath the eaves at the end of an outhouse on the farm-steading of Granton, in Dumfriesshire.

They varied considerably in form and size. Those in corners were of an irregular, rounded shape, rectangular above, where they were fitted to the angle, convex in front, and having on the side at the top a semicircular aperture. In general, the nest is open at the top, when not fastened under a beam or in a corner, &c."—*Henry W. Hadfield; Elgin, N. B., August* 26, 1858.

Extraordinary Variety of the Common Nightjar.— Under the above heading (Zool. 5278) I recorded the occurrence, in July, 1856, of two most singular varieties of the nightjar, a bird that rarely varies in plumage: these specimens, which were young birds of that season, were killed near Holt, in this county; and singularly enough, a few days since, an adult bird exactly resembling the above, except in age, was shot in the same neighbourhood. I am not aware that any pied specimens of this species were observed in that district in the summer of 1857, but it would almost appear from this circumstance that one of the original pied brood had escaped destruction, and returned in an adult state to its old quarters. This specimen had the throat, breast, belly and vent with the wings and three middle tail-feathers pure white.—*H. Stevenson; Norwich, September* 7, 1858.

Note on the late Nesting of the Wood Pigeon.—Both the wood pigeon and the stock dove often nest very late in the year, as an instance of which, in the case of the wood pigeon, I may mention that my son found one of these birds this morning, sitting on two eggs in a nest built in a thorn tree in my park.—*J. H. Gurney; Catton Hall, Norwich, September* 10, 1858.

The Red Grouse and the Willow Grouse.—With reference to my late communication, touching the identity of our red grouse with the Norwegian willow grouse (Zool. 6209), I think two out of the three difficulties raised by Mr. Newman can be explained in a satisfactory manner. Mr. Newman's *first* objection, *viz.* that "the willow grouse turns white in winter, in the same manner as the ptarmigan, whereas the red grouse, although inhabiting the same districts, exhibits no such tendency," is, I think, easily explained by the fact of the red grouse in this country never having to experience the same severity of climate that the willow grouse has to endure in Norway. That the ptarmigan in Scotland turns white in the winter-time is perhaps accounted for by the supposition that it inhabits mountain regions higher than those frequented by the red grouse. I am not sure, however, that I am correct in this supposition, but it is a matter easily ascertained. *Secondly*, Mr. Newman says the wings of the willow grouse are always white, those of the red grouse never. However reluctant I am to offer an opinion at variance with so great an authority, I trust he will pardon me for thinking he is incorrect here. The wings of the willow grouse which I flushed in the Dovrefjelds were certainly not white, but of a light tawny-brown colour (so far as I can recollect about the same colour as the back of the land rail). I am sorry I did not examine the wings of the specimens in the Christiana Museum more closely, but my present impression is that those in the summer plumage had not the wings white, but more or less mixed with brown, like the rest of the body. Had the wings been entirely white (as Mr. Newman suggests) I should surely have noticed the peculiarity. On this point, however, I will not be certain, for the wings might possibly have been concealed more or less by the bringing forward of the shoulder feathers. The *third* objection (that the beak of the willow grouse is much stronger than that of the red grouse), is a serious one, no doubt, and if correct entirely upsets my speculations on the subject, as it may fairly be regarded as a specific character. When comparing specimens of the willow grouse with the ptarmigan in the Christiana Museum, the smallness of the beak of the latter was very conspicuous in comparison with the stout beak of the former. I did not, however, remark that the beak of the willow grouse was any stouter than the beak of our red grouse; had it been otherwise I think I should have noticed it. This latter point appears to me to be the most important question to solve, and I trust that some reader of the 'Zoologist' having specimens of both species will carefully compare the two, and communicate the result in an early number.—P.S. Three slight inaccuracies occur in my communication above referred to. In the 9th line *apical* should be *species of;* in line 16 *dead* should be *dense;* and in line 24 *field* should be *Fjeld.*—*G. Norman; September* 3, 1858.

[I have an almost unconquerable aversion to that propensity, so dear to British naturalists, whether zoologists or botanists, to raise those infinitesimal varieties which occur in Great Britain to the rank of species. Lepus hibernicus, *Bell;* Pontia Chariclea, P. Metra and P. Sabellicæ, *Stephens;* Satyrus Polydama, *Stephens;* Lycæna dispar, *Haworth;* Polyommatus Artaxerxes, *Lewin;* Thymele Lavateræ, *Haworth;* Trichomanes brevisetum, *Brown;* Hymenophyllum Wilsoni, *Hooker;* Equisetum Drummondii, *Hooker*, are British species that have obtained rather voluminous notice at my hands, with the view of proving that they were identical with species previously well established. When, therefore, Mr. Norman's note came to my hands, it touched a chord that instantly vibrated in unison: I have always maintained that it was highly improbable we should possess in abundance a bird that was unknown elsewhere in the world. Great however as this improbability may be, we must not hastily link our British grouse to another species, provided it possess a single *constant* diagnostic character. What Mr. Norman has to say on this subject, my own objection to his views, and Mr. Norman's rejoinder, are now before the readers of the 'Zoologist.' I will not invite Mr. Gould, who appears somewhat pledged to an opinion, but I do earnestly invite the four ornithologists, who are *par excellence* the *British* ornithologists, to express candidly and fully their opinions on this interesting question. I allude of course to Mr. Doubleday, Mr. Bond, Mr. Salmon and Mr. Wolley: I know that all these gentlemen are constant readers of the 'Zoologist,' and I am sure all will be able to throw light on a subject of such importance. I shall be extremely gratified to publish their views in the November 'Zoologist.'—*E. N.*]

Varieties of Black Grouse and Hybrid between Blackcock and Capercally.—I have recently examined a very interesting collection of grouse, brought from Russia by Lord Wodehouse, of Kimberley, collected during his recent Embassy at St. Petersburgh: amongst these are some pied varieties of the black grouse, which are the more striking from this species so rarely exhibiting the slightest variation in plumage. Hybrids between the black grouse and capercally, in countries where both species are plentiful (as in Russia), are, I believe, not unfrequently met with. The following are the most worthy of note:—

No. 1. An adult male blackcock with the wings, scapular, flanks and upper tail-coverts white, the centre only of each feather having a dark streak along the line of the quill, in some scarcely broader than the quill itself. The breast and back are mottled with white, like some varieties of the common blackbird, and the feathers on the legs are also very light.

No. 2. A gray hen mottled all over with white feathers, the remaining portion being of the usual tint. This specimen much resembles occasional varieties of the common partridge.

No. 3. A gray hen gradually assuming the cock's plumage. In this specimen the feathers on the throat and breast are becoming grayish black, with slight purplish reflections; the feathers on the back are likewise edged, more or less broadly, with circular bands of dark purple, shining with a metallic lustre; the tail feathers are slightly curved outwards, after the manner of the male birds.

No. 4. A very light buff-coloured variety of the gray hen, bearing all the usual markings in its plumage, but fainter in tint than is usually the case.

No. 5. A specimen of the Tetrao medius, or Urogallus hybridus of authors. This cross between the capercally and black grouse so exactly corresponds with the description of a specimen exhibited by Mr. Gould at the Zoological Society in the spring of 1831, that an extract from the 'Proceedings' of the Society at that date may suffice for the present instance:—"The beak is black, the shining feathers on the front of the neck are rich Orleans plum-colour, and of the eighteen feathers of the tail the outer ones are the longest. In the cock-of-the-woods the beak is white, the feathers on the front of the breast are a dark glossy-green, and the centre feathers of the tail the longest."

According to Mr. Yarrell, "The size and colour of these hybrids greatly depend upon whether they have been produced between the capercally cock and gray hen or *vice versa*." Females of these hybrids appear much more rare than males.—*H. Stevenson; Norwich.*

Occurrence of the Pigmy Curlew at Weymouth.—On the 28th of this month I bought an adult pigmy curlew, for which I gave twopence; it was shot with a number of purres, all young, and was offered me tied up in a bunch with them.—*William Thompson; Weymouth, August* 29, 1858.

Snipes Neighing or Humming.—On the origin of the neighing sound which accompanies the snipe's play,—that is, its flight during pairing time,—opinions are various. Bechstein thought it was produced by means of the beak; Naumann and others that it originated in powerful strokes of the wing: but since Pralle, in Hanover, observed that it uttered its well-known song or cry, which he expresses by the words "gick jack, gick jack," at the same time with the neighing sound, it seemed to be certain that the latter was not produced through the throat. In the meantime I have remarked with surprise that the humming sound could never be observed while the bird was flying upwards, at which time the tail is closed, but only when it was descending in a slanting direction, with the tail strongly spread out. The peculiar form of the tail-feathers in some foreign species nearly allied to the common snipe, for instance, in Scolopax javensis, encouraged the notion that the tail, if not the only cause, is in a considerable degree concerned in the production of the sound. On a closer examination of the tail-feathers of our common species, I found the first outer feather especially very peculiarly constructed; the shaft uncommonly stiff and sabre-shaped; the rays of the web strongly bound together and very long,—the longest reaching very nearly three-fourths of the whole length of the web, their rays lying along or spanning from end to end of the curve of the shaft, like the strings of a musical instrument. If we blow from the outer side upon the broad web it immediately vibrates, and a sound is heard, which, although not so loud, resembles very exactly the well-known neighing. In order to convince myself fully that it was the first feather that produced the peculiar sound, it was only necessary for me carefully to pluck out such a feather, to fasten its shaft with fine thread to a piece of steel wire a tenth of an inch in diameter and a foot long, and then to fix this at the end of a four-foot stick. If now I drew the feather, with its outer side forwards, sharply through the air, at the same time making some short movements or shakings of the arm, so as to represent the shivering motion of the wings during flight, the neighing sound was produced with the most astonishing exactness. If I wished to hear the humming of both feathers at once, as must be the case in the flying bird, I found this also could be managed by a simple contrivance. I take a small stick, and fasten to the side of the smaller end a piece of burnt steel wire in the form of a fork; then I bind to each point a side tail-feather; then bend the wire so that the feathers receive the same direction which they do in the spreading of the tail as the bird descends in flight; and then, with this apparatus, I draw the feathers through the air, as before. Such a sound, but in another tone, is produced when we experiment with the tail-feathers of other kinds of snipe. But in Scolopax major, S. capensis and S. frenata are found four humming feathers on each side, which are considerably shorter than in the species I have been speaking of. Scolopax javensis has eight feathers on each side, which are extremely narrow and very stiff. Since in both sexes these feathers have the same form, it is clear that both can produce the humming noise; and by means of experiment I have convinced myself that it is so.—*W. Meves; Conservator of the Zoological Museum at Stockholm.*

[Mr. Wolley, who saw the experiment repeatedly performed, was perfectly satisfied that this mode of explaining the neighing is the correct one.—*Edward Newman*].

Duck breeding in a Church Tower.—The 'Sussex Express,' of July 24, gives, in answer to inquiries, further information respecting the duck nesting in the church tower of Bosham (not Rottingdean, as appears from the omission of the former name), which is noticed in the 'Zoologist' (Zool. 6144). Two ducks were originally observed on the weathercock of the church, probably a pair, though that fact was not ascertained, one only having been seen within the tower, which bird was of the breed usually termed Muscovy. Many persons witnessed her flying to and from her elevated nest, where she had several visitors, and where she sat upon twelve eggs, of which eight proved productive, but unfortunately solicitude for the safety of the young ones caused them to be carried down by hand, so that the problem how the old duck would have conveyed her progeny to the ground was not solved. The above-named newspaper states that another duck of the same kind, elsewhere in the parish of Bosham, hatched twelve young ones in a pigeon-loft, bringing them all down herself, but how she accomplished it is unknown.—*Arthur Hussey; Rottingdean, August* 17, 1858.

Occurrence of the Little Gull near Barnstable.—On the 30th of last month I met a gentleman on the sands near Braunton Burrows, who had just had the rare piece of luck to shoot a brace of the beautiful and rare little gull (*Larus minutus*). I had these specimens in my hands ere they were cold, and noted that they were birds in an intermediate state of plumage, but looking so near the adult stage that I should think it probable that, had they lived, next spring would have seen them in the rare mature plumage. I believe it to be a fact that the gulls (like the falcons and some other of our birds) go through several moults before they arrive at that peculiar plumage which marks an old bird. A gentleman has told me that he watched, this spring, a large breeding-station of the herring gull (*Larus canus*), and was struck by the fact that the brown birds (*i. e.* birds of the year before) kept aloof from those then actually breeding, and seemed to be waiting their time until they had reached their perfect breeding plumage. The two specimens of the little gull I allude to had the crown of the head and back pale French blue; on the nape of the neck was a black patch, almost forming a ring round it; the wing-feathers were broadly marked with transverse bars of a rich black; the tail appeared short and broad even for a gull, and the beak and legs were greenish black. I had nothing with me to measure the length of the birds, but their bodies appeared no larger than a pigeon's.—*Murray A. Mathews; Raleigh, near Barnstable, September* 6, 1858.

Shark on the Coast of Sussex.—The 'Sussex Express,' of August 14, states that a specimen of the porbeagle shark, 6 feet 8½ inches long and 3 feet 8¾ inches in circumference, was captured in Seaford Bay by the crew of an Eastbourne mackarel boat during the night of August 8.—*Arthur Hussey; Rottingdean, August*, 1858.

Occurrence of the Sunfish at Berry Head. — A specimen of the sunfish (*Orthogariscus mola*) was shot this day, August 14th, by a yachtsman, about a mile off Berry Head, the southern extremity of Torbay, and brought into Torquay, where it was exhibited by two fishermen. It measured 2 feet 4½ inches in length, 3 feet 2 inches between the extremities of the fins, and 14½ inches in greatest breadth, exclusive of the fins. This is the second specimen of this remarkable fish captured here this summer.—*William Pengelly.*

Additions to the Butterfly Fauna of South Wales.—I have certainly three, and I believe four, more species of butterflies to add to the Fauna of South Wales, as "Area 6:"—Colias Edusa, Leucophasia Sinapis, Polyommatus Agestis, and I believe P. Acis too; of this latter I will not say for certain, because it is so rare and local a species, but I herewith send you a very careful description, which I write with the insect before me, and from which perhaps you will be able to decide. The three first species I have seen on the wing and taken this month, while on a short tour in search of health, in company with a young brother of the pin and net, and it was he who took P. Acis about three weeks back, and shewed it me to have my opinion upon it: I have no doubt he would allow me to send it you for inspection, if you are not satisfied of its identity,—I am myself, but dare not record it on my own conviction only, when the female Cardamines has been mistaken for Daplidice. You will now think with me that the area lately given without a representative is one of the richest, for we may hardly expect P. Artaxerxes, C. Davus, P. Actæon or E. Blandina; and C. Hyale, P. Arion, C. dispar, P. Daplidice, A. Lathonia and V. Antiopa are almost as unlikely to visit us, so that we have but little that is probable to hunt for now.—*Robert Drane; Cardiff, August* 21, 1858.

[The description certainly applies to P. Acis.—*E. N.*]

Polyommatus Artaxerxes and Agestis.— Mr. Newman, in his observations in last month's 'Zoologist' (Zool. 6211), makes it appear that I do not know the larva of P. Agestis. Now, I admit that I made a mistake by sending in a hurry the wrong larvæ to Mr. Logan: in my haste in collecting the larvæ, finding some small green larvæ with a purple marking, and without any examination, I sent them to Mr. Logan for the young of Agestis; but is this to go against eight years' practice and ten correspondents who have bred the insect this season from larvæ I have sent them? I will most fully atone for this error when I am on the ground again next June. I have never seen Mr. Newman's observations on this subject in the 'Entomological Magazine': if that gentleman wishes to break a lance with me he must take care it does not get broken; I think I have bent it for him already in the very first thrust. Mr. Newman has also made a great mistake in stating that the larvæ I found feeding upon pellitory were those of Vanessa Atalanta. I still positively state that they were Cynthia Cardui. (See 'Entomologist's Weekly Intelligencer' for July, No. 94, p. 125). After the Cardui were full fed, then came the Atalanta; this I found out myself after I had bred some of them. — *H. J. Harding; 1, York Street, Church Street, Shoreditch, September 2, 1858.*

[I am well aware that if I append a single word to this communication I give Mr. Harding the right of a second reply: to this he is most welcome; indeed, I think he is rather called on to give a little further explanation: if I clearly comprehend this communication, Mr. Harding admits that he did send to Mr. Logan, "without examination,' certain larvæ as those of Agestis in "error;" but at the same time he states that *this season* he has sent the right larvæ "to ten correspondents." Now, in his first communication, Mr. Harding only refers to what he did years ago and leaves untouched the fresh evidence of the present year. Of course I could only deal with the first statement while I was ignorant of the second, but Mr. Harding's reply above seems to corroborate my assertion, that the footless green larvæ mistaken by him for those of a butterfly were actually those of a beetle: is not this the very error for which Mr. Harding proposes to atone next spring? Then again, as regards Atalanta, did not Mr. Harding mistake the larvæ of Atalanta for those of Cardui? and did he not "find this out himself after he had bred some of them?" It seems to me absolutely impossible that Mr. Harding should not know the larva of Atalanta; but how else shall we read his own explanation? I now can only say, in conclusion, that my friend Harding shall enjoy the unmolested privilege of a final reply, and that no editorial commentary shall be appended thereto.—*Edward Newman*].

The Artaxerxes Question.—I know nothing of the larva of P. Agestis, and therefore can give no opinion as to whether it is or is not a variety of P. Artaxerxes. It appears, however, to me, that till both species have been reared from the same larvæ, no one has a right to say that they are identical. I must confess that I am an utter unbeliever in what are called permanent varieties or races. If a so-called variety lays a brood of eggs which all produce a moth precisely similar to the parent, I maintain that this is the strongest possible evidence that this so-called variety is a species. Mr. Logan remarks (Zool. 6100) that he should never expect to rear Artaxerxes from an egg laid by Agestis, and *vice versâ*: he could not, to my mind, in the absence of other evidence, have used a more convincing proof that the species are distinct. I have never yet heard or read anything which has induced me to believe in the existence of permanent varieties or races in Lepidoptera. I do not think that the experiment has been tried upon a sufficiently large scale to warrant the adoption of any such theory. Mr. Harding remarks (Zool. 6211) that the larva of P. Alexis is very seldom found: I can only say that it is very plentiful here; I have taken it by dozens when brushing Ononis campestris for the larva of H. marginata. I do not know whether the larva of P. Agestis is apodal, but that of P. Alexis certainly is not, at least not more so than the larva of the Thecla, which it closely resembles; indeed a tyro would find it hard to distinguish between the larva of T. Rubi and P. Alexis. The latter can walk about perfectly well and crawl about its food-plant; it drops at the slightest touch: the pupa, like that of T. Quercus, is enclosed in a slight web at the roots of the grass. I see no reason why the larva of P. Agestis should suffer from apodal affliction when its brother Argiolus is free to revel on the top of a holly tree, and I am at a loss to conceive why

Mr. Harding should have condemned it to so hard a fate. The coleopterous conclusion of the matter, however, may hold out a hope that better times are coming.—*H. Harpur Crewe; Stowmarket, September* 3, 1858.

Connexion of Polyommatus Agestis with Helianthemum vulgare.—In the Agestis-Artaxerxes controversy which is now being carried on in the 'Zoologist,' great stress appears to be laid on the fact that the larva of Agestis feeds on Erodium, while that of Artaxerxes feeds on Helianthemum. That the larva of Agestis does feed on Erodium is asserted principally on Zeller's evidence, as it seems Mr. Harding has made a mistake in his larvæ. It is certainly presumptuous in me to differ from Zeller, but had any one asked me, before I ever heard of this controversy, on which of the two plants I thought Agestis fed, I should not have hesitated to say Helianthemum. The facts on which I found my belief are as follow: I have taken Agestis in two places in Flintshire; the first is on a rocky limestone hill overhanging the Talargoch Mine; here Helianthemum vulgare grows in great abundance, and I am almost certain that Erodium does not occur. At Rhyl, however, which is barely four miles distant, and probably at Prestatyn also, which is only two miles and a half off, Erodium cicutarium is abundant on the sand-hills, but no Agestis is to be found. The second place is also on rocky ground, about three miles from Holywell; here again Helianthemum is abundant, but Erodium is not to be found anywhere in the neighbourhood. So closely does this insect stick to the spot where Helianthemum grows, that in an open place (about two hundred yards from the small space where it is found) which swarms with H. Hyperanthus, A. Aglaia and P. Alexis, I have never seen a single specimen: the two spots are separated by trees. In conclusion, I may add, that I am not arguing that Artaxerxes and Agestis are varieties of the same species, but merely that evidence is in favour of the larva of the latter feeding on Helianthemum vulgare.—*Alfred O. Walker; Chester, September* 12, 1858.

Double-broodedness of the Notodontidæ.—I beg to lay before those readers of the 'Zoologist' who may feel interested, the result of my experiments during the present summer and autumn with Pterostoma palpina, Notodonta dictæa and N. ziczac. It was made known through the pages of the 'Zoologist' and 'Naturalist' that I gathered sufficient larva of P. palpina and N. dictæa to lead me to hope I might obtain fertilized eggs of both species the following spring, and thus be able to supply that information as to their double-broodedness which was wanted; for I may be allowed here to remark that although this double-brooded question has been so long discussed, no one seemed to set about producing proof. The following are the results of my endeavours to supply the want of facts. On May 28 the imago of P. palpina began to emerge, and within the week every pupa produced a moth. I obtained two sets of fertilized eggs; the first batch was laid May 30 and 31, and hatched June 8 and 9; the larva buried June 27 to July 4, and the imago again emerged between July 27 and August 5. Another batch laid June 6 and 7, hatched June 14 and 15, larva buried July 10 to 17, moths emerged August 5 to 12. A small portion of the first batch was placed out of doors, and remained so throughout; the hatching and moulting scarcely varied from those in confinement; birds, spiders and storms, however, so reduced their numbers that I only got three into pupa, two of which emerged August 5; the third is still in pupa: this and subsequent experience with this and other insects, has satisfied me that mere confinement produces no effect on it whatever. The imago of N. dictæa emerged June 1, eggs were laid June 3 and 4, hatched June 12, larva buried July 13 to 19, moths emerged August 12 to 17. The larvæ of both these species were fed on growing plants, the eggs being placed among the foliage, and not removed until after the last month preparatory to their going down. I did not this season rear N. ziczac from the egg, considering the facts produced last year to be conclusive, but Mr. Greene, in the 'Naturalist,' raises the objection that my experiments were with insects in an "abnormal" state. What has he to object to in the following? On July 17 I took twenty-two full-fed larvæ of N. ziczac, twenty of which went down immediately (two dying). One imago emerged August 12th, eleven on the 13th, three on the 14th and five on the 15th; the pupæ were out of doors most of the time: they were of course the produce of the May moth, and will be admitted to have been reared in a "normal" state. These results require no comment, they sufficiently speak for themselves. I hope the opponents of double-broodedness have also been pursuing similar researches, and are prepared to lay the results before the public, or to accept these as conclusive. I wish to draw particular attention to the following by Mr. Greene, in the 'Naturalist' of May last: alluding to Mr. Crewe's remarks, he says, "His (Mr. Crewe's) answer to my main, I may say my only, objection is not satisfactory. My objection was and is, that of the pupæ dug up even as early as the beginning of August, there is no instance on record of the perfect insect appearing from them the same year." I now produce the "instance" Mr. Greene requires, for undoubtedly those of N. ziczac might have been dug up "early in August," if I had not taken the larva just before going down; they produced the moth the "same year," without forcing, after being in the pupa state about three weeks (the duration exactly corresponding with my experiments of last year). Mr. Greene goes on to say, "I dig at poplars, oaks, elms, &c., all the year round, but I never found a pupa of either (dictæa or camelina) between the first week in June and the last in July." The reason is evident; these insects being double-brooded are in the larva state during the time mentioned, and therefore, as Mr. Greene says, not to be found in the pupa. I have taken the larva of N. dictæa in July, which produced the moth in August; I have again taken larvæ in September, which produced the perfect insect in May or June. I breed from these, again producing the moths in August, and at the time I am writing I have young larvæ of both N. dictæa and P. palpina feeding, the produce of the above, which will doubtless produce the perfect insect next spring.—*George Gascoyne; Newark, September*, 1858.

Cerura bicuspis and Acronycta Alni.—I took, on Thursday last, the 12th instant, a fine larva of C. bicuspis, and on Saturday, the 14th, the larva of A. Alni, nearly full grown; both of them appear to relish in confinement the alder, upon the leaves of which I found them. I also found, on the 12th, two Coleophora larvæ, feeding in the seed-pods of the gorse or furze. My friend, Mr. Wilkinson, says they will be C. albicosta.—*R. Cook;* 10, *Castle Crescent, Scarborough, August* 16, 1858.—'*Intelligencer.*'

Occurrence of Timandra prataria near Folkestone.—I took a good specimen of this Geometra near Folkestone the latter part of July last, but though I searched well for a week, I was unable to meet with another.—*H. Tompkins;* 44, *Guildford Street, Russell Square, London, September* 16, 1858.

Sterrha sacraria a British Insect.—There is a record of the capture of a *second* specimen of Sterrha sacraria on the wrapper of the September 'Zoologist;' I call it a *fourth* British specimen of sacraria. I possess the first, taken by Mr. Howse, near Bristol; Mr. Reading records a second, taken near Plymouth; Dr. Battersby, a third, taken near Torquay; Mr. Barrett's is, therefore, the fourth; unless some further information be given, perhaps his specimen may also be doubted.—*J. C. Dale; Glanville's Wootton, near Sherbourne, September* 13, 1858.

[I willingly supply the further information desired. Mr. Barrett is one of our most persevering and most successful searchers of the gas-lamps: one night he took a Geometra with which he was totally unacquainted; he came the next morning and described the new capture, which, as he is remarkably accurate and precise, I concluded at once to be sacraria, and told him so: the news seemed almost too good to be true; but as soon as the insect could be moved from the setting-board it was obligingly brought to this office, and I will vouch for its being a genuine sacraria. I would willingly communicate to Mr. Dale, through the 'Zoologist,' the very lamp-post that produced this treasure, but Mr. Barrett has not permitted me to do so.—*Edward Newman*].

Larva of Camptogramma gemmaria.—A lovely female of this species laid me some eggs on the 24th of July; they were oblong, flattish and yellow, but changed to a dusky brown colour on the 1st of August: the following day the larvæ hatched; at first they were very dingy, but on the 8th of August became dusky sap-green, and on the 16th assumed their characteristic markings. There were evidently two distinct varieties, one of which had the ground-colour of a greenish gray, tinged with red between the segments; the spiracular line blackish and irregularly interrupted; the back (except the last two segments) dusky, having on the intermediate segments a row of five elongated diamonds of the ground-colour, with a dusky dot in each; on the front segments these markings ran into three parallel dusky lines, while on the end segments there were four slender dusky lines arranged in a diamond pattern; the prolegs had a dusky stripe running down them. The other variety had the ground-colour of a light yellowish green, quite yellow between the segments; the spiracular line and the pattern on the back faintly indicated by dusky black lines and dots. These larvæ fed readily on groundsel (*Senecio vulgaris*), at last eating through stems bigger than themselves; but, as their frass seemed very watery, I doubt whether this is their proper food. They were quiet in their habits, resting on the under side of the leaves, hiding themselves skilfully, and could not be easily dislodged; when disturbed they curled up the front segments, but not into such a twisted knot as I have sometimes seen in more slender loopers. From the 21st to the 23rd of August the larvæ, being full fed, spun up in moss. After having been in pupa about a fortnight, the perfect insects emerged. There went down two of the green and four of the darker larvæ; there have come up again one C. fluviata (♂) and five C. gemmaria (♀)—such a narrow risk did I run of missing the solution of this problem! Solved, however, it is, and C. fluviata and C. gemmaria are hereby declared to be man and wife. I expected to find the difference of colour in the larvæ would turn out to be a sexual one; this, however, has been contradicted by the result. The pupa is brown, smooth, spiked at the tail, enclosed in a thin silken cocoon in moss. I have now seen in all about fifteen specimens of C. fluviata and six of C. gemmaria, and find that the absence in each of what were considered the distinctive markings of the other is not constant: the subapical blotch of C. fluviata may be traced more or less distinctly (sometimes quite distinctly) in C. gemmaria; while some specimens of C. fluviata have the central spot placed in the light ring, only the dark ground of C. gemmaria makes this ring shine forth much more brightly, just as a nigger's sable skin enhances the whiteness of his eyes. One of my bred specimens, having given me the slip over the edge of the table, was detected in a dark corner of the room by the white spots on the fore wings. As to the other markings, they are, line for line, precisely similar; so that the ground-colour alone remains to make the sexes look unlike, and perhaps further breeding may sometimes upset this.—*Anon. in 'The Intelligencer.'* [The name known to me.—*E. Newman*].

Habits of Camptogramma gemmaria.—I quite agree with Mr. Gregson that C. gemmaria is a swamp insect: I have taken a fine series this season (the female is the C. gemmaria and the male the C. fluviata of Guenée's arrangement): it occurs at the Boiling Well, near Ashley Hill, and also in some meadows near here; in both instances in low swampy ground. Each of the females I took kindly supplied me with eggs, but unfortunately none of them have proved fertile, so that my expectation of being able to rear it from the egg has come to an end, at least for the present.—*G. Harding, jun.; Stapleton, Bristol, August* 27, 1858.—'*Intelligencer.*'

Camptogramma gemmaria and C. fluviata.—I have lately taken a fine series, the female being C. gemmaria, the male C. fluviata of Guenée's arrangement. I have no doubt that these insects constitute but one species, having taken two male specimens of the latter hovering over a female of the former: all the specimens I possess have occurred in low marshy places; one I took from off a willow.—*Henry Bolt;* 15, *Beaumont Place, Stapleton Road, Bristol, September* 14, 1858.

[I may add to these interesting communications that in the 'Synonymic List of British Lepidoptera,' by Messrs. Guenée and Doubleday, these insects stand as a single species: the list will be advertised for publication in a few days.—*Edward Newman*].

Occurrence of a Peronea new to Science at Liverpool.—I am now taking the second brood of a pretty, variable, yet distinct, little Peronea, the P. potentillana of Cooke; they feed exclusively upon the leaves of the strawberry, preferring the white-fruited varieties. On the 8th of September they were in profusion flying over the strawberry-beds; I ran for my net, leaving Mr. Almond trying to box a few; on my return the pic-nic was over, and I only secured a few "choice spirits" who did not intend to go home till "daylight did appear." On the 9th instant, which was cold and windy, I saw two; I took one and left the other to breed; on the 10th five were seen, three of them in bad condition; 11th a close evening, I was closely engaged in looking after my little favourites, everybody else spying for the comet, which everybody said was about 10 degrees high in the north-west corner of the sky, but which I did not see, for just then up got my "flee," and I secured about a dozen good ones, when the revels were over, and not another could be seen, where one minute before hundreds were on the wing!—*C. S. Gregson; Fletcher Grove, Stanley Liverpool, September* 12, 1858.—*From the 'Intelligencer.'*

Carabidæ in the Isle of Sheppey.—The result of recent excursions in this district prompts me to recommend it as a productive field to coleopterists generally and the student of the Geodephaga in particular. The main object of my first visit was the rare Stenolophus elegans, whose head quarters in the neighbourhood of Sheerness are known to an elect few. On reaching the well-known spot, which has hitherto supplied all collections, "Hope sighing fled,"—the place was completely submerged, and not a specimen could be won from the adjacent soil. Much of the neighbouring marsh land had been newly broken up by the plough, and the clods, with the surface-grass attached, had lain sufficient time to afford convenient shelter for Coleoptera, the profusion of which both surprised and interested me. In such situations I took pretty freely, together with others of lesser note, the large Hister 4-maculatus and Zabrus piger. Early in the present month I made a second visit, and after considerable effort was rewarded by the capture of eight specimens of S. elegans, which I took by the road-side leading to Queenborough, and about half-a-mile from the spot where it was originally discovered. On turning the clods I found in company with Amara convexiuscula and a host of Harpalidæ, Anisodactylus pœciloides, of which I secured an ample supply, in all its beautiful varieties of green, purple and copper: as there is reason to suppose that no other station yields this insect so plentifully, I have deemed the record not unworthy a corner in the 'Zoologist.'—*A. Haward; Gloucester Road, Croydon, August* 23, 1858.

Calosoma Sycophanta near Bristol. — On the 30th of June last Miss Powell, of Henbury, had the good fortune to secure a perfect specimen of this magnificent beetle, conspicuous alike for its rarity and beauty; it is probable that a living specimen has never before been seen in this part of England. With the greatest liberality Miss Powell has presented me with her specimen.—*P. V. Vaughan; Redlands, Bristol.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

September 6, 1858.—Dr. GRAY, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Stettiner Entomologische Zeitung,' Nos. 4—9; presented by the Entomological Society of Stettin. The 'Zoologist' for September; by the Editor. The 'Journal of the Royal Agricultural Society of England,' Vol. xix. Part 1; by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. iii. No. 9; by the Society. 'Catalogue of the Birds in the Museum of the Hon. East India Company,' by Thomas Horsfield, M. and Ph. D., F. R. S., Keeper of the Company's Museum, and Frederic Moore, Assistant; by the Court of Directors. The 'Journal of the Society of Arts' for August; by the Society. The 'Literary Gazette' for August; by the Editor. The 'Athenæum' for August; by the Editor.

Exhibitions.

Mr. Janson exhibited, on the part of Mr. H. Squire, a box of Coleoptera, collected by him during a visit which he had just made to the Shetland Isles, and remarked, that considering the period of the year at which this trip was undertaken, his short stay of a week only, and the limited district which he had investigated (for the unpropitious state of the weather had precluded him from extending his excursions beyond three miles from Lerwick) the series now before the Meeting must be looked upon as highly satisfactory. The number of species amounts to one hundred and twenty-five, and, although the major portion of them are forms familiar to every London entomologist, still there are among them several to which he would direct the attention of the Meeting.

The first of these is apparently a species altogether new to the British list, the veritable Nebria (Carabus) nivalis of Paykull, which Drs. Kraatz and Schaum have recently shown is not identical with N. Gyllenhalli, *Schonh.*, as had been generally supposed. The specimens now under consideration differ from N. Gyllenhalli (the *ci-devant* nivalis of British collections) in having a smaller thorax, which is more narrowed posteriorly; the striæ on the elytra are much shallowed, and the impressed points or punctures much more evident; and, moreover, the femora are black, the tibiæ and tarsi alone being red.

The second is a Patrobus which does not entirely correspond with the P. excavatus, *Payk.*, *Dawson*, differing in having the thorax shorter and more rounded at the sides and its sculpture coarser; it appears to agree with an insect taken by Mr. Murray in the Clova Mountains, by the Rev. Hamlet Clark in North Wales, and by Dr. Power in Lancashire. Mr. Squire, who has compared it with continental specimens of P. lapponicus, *Chand.*, in the national collection, refers it to that species.

The third is a species of Hydroporus manifestly differing from any at present in our list, and which the Rev. Hamlet Clark considers will, in all probability, prove to be the H. Lapponum of Gyllenhal.

Fourthly, Hydroporus halensis.

Fifthly, Otiorhynchus maurus.

And lastly, an Omalium, which is scarcely referrible to any of the recorded species.

Mr. Stevens exhibited a specimen of Pieris Daplidice, taken by Mr. Spencer, near the South Foreland lighthouse, on the 6th of August last.

The Rev. Hamlet Clark exhibited a box of Coleoptera, recently taken by Dr. Power in Lancashire, containing an extensive series of Bembidia, and numerous rare Staphylinidæ, &c.; also a singular monstrosity of Bembidium concinnum, having 2½ tarsi on one of the fore legs; a specimen of Euryporus picipes, taken at Preston Marsh by Mr. Graham; and Hydroporus ferrugineus, also from Lancashire, being a new locality for that rare species. He also exhibited a specimen of Opilus univittatus, *Rossi*, a species hitherto considered peculiar to Italy, which had been sent alive in a pill-box to Mr. Baly, by a lady residing at Malvern.

Mr. Stevens exhibited a small box of insects, sent by Mr. Shield from Monte Video, containing, amongst other minute Coleoptera and Lepidoptera, a singular species allied to Claviger, found in ants' nests, and a Lithocolletis closely allied to L. lautella of Europe.

Mr. Douglas exhibited an apparently new species of Coleophora, found amongst Atriplex, at Seaford, in Sussex; also a small Heterocerus, and a Bryaxis, of which he had been unable to determine the species, found in the mud under stones in the same locality.

Mr. McLachlan exhibited an Acrobasis, new to Britain, taken at Forest Hill, which Mr. Stainton had pronounced to be A. rubrotibiella of Mann., a species hitherto only found near Vienna: it is closely allied to A. tumidella, though sufficiently distinct, as pointed out by Fischer-von-Röslerstamm in his illustrated work.

Mr. Bond exhibited four fine bred specimens of Carpocapsa saltatans, *Westw.*, with the pupa cases and seeds from which they had emerged.

Mr. Waring exhibited a singular pale variety of Pœcilocampa Populi.

Mr. Adam White exhibited the flat pupa-case of a Cebrionideous genus from North China, and remarked on the vast field of research still open to entomologists in the transformations of Coleoptera. He also communicated the following:—

"Mr F. G. Nicolay, a promising young naturalist, who lately went to St. Salvador, Brazil, sent over, within a week or two of his landing, a box containing the following insects. The list may be not unworthy the notice of the Members, and its publication may encourage youthful entomologists to persevere, and ascend from collecting to observing transformations:—

Papilio Thoas
„ Polydamas
Heliconia Halia
Evides Dianasa
Mechanitis Lysimnia
Agraulis Vanillæ
„ Julia
Danais Gilippus
„ Archippus
Terias tenella
„ Mana
Callidryas Eubule
Ageronia Ferentina
Vanessa Lavinia
Anarta Iatrophæ
„ Amalthea
Heterochroa Cytherea
Argynnis Hegesia?
Didonis Biblis
Polyommatus and three or four Hesperiæ.

Beetles.

Phanæas Jasius (very common)
„ principalis
Cyclocephala melanocephala?"

Mr. Tegetmeier observed it was generally believed that pollen was only used as food for the larvæ of bees, and not by the perfect insects; he had, however, frequently observed bees on the alighting-board of a hive, especially in dull weather, eating the pollen from the legs of their companions as they arrived. He had continued the experiments detailed by him at the July Meeting of the Society, with a view of ascertaining the cause of the hexagonal form of the cells of the hive bee, and found that when excavating in a solid mass of wax they always formed cylinders, but on the sides of the cells approximating they invariably became hexagonal; he considered therefore that the hexagonal form resulted simply from the cells being constructed with a view to the greatest economy of space, and not from any predetermined plan on the part of the bees.

Mr. Lubbock remarked that Mr. Darwin had made similar experiments to those described by Mr. Tegetmeier, with precisely the same results.

Mr. Smith maintained the assertions made by him at the July Meeting that in wasps' nests the cells are constructed of an hexagonal form, and do not acquire it from compression or any other cause. He exhibited the nest formed by the female of Vespa vulgaris in the spring, as sufficient proof that the hexagonal form was not caused by two insects working at the same time at the formation of adjoining cells, as had been suggested to be the cause with bees; he also exhibited nests of a South American species of Polybia, and of Icaria guttatipennis, in which he observed the outside cells were as angular as those in the centre of the layers of comb, thus proving that the hexagonal form could not, in these instances, result from lateral pressure.

Dr. Gray observed that the theory of lateral pressure certainly was not applicable to the cells of wasps, as they are constructed of a material, which when once hardened never alters its form.

Mr. Downie exhibited a small observatory hive of his own invention, fixed on the top of the stock hive, and a hive, constructed by him, with an improved mode of ventilation.—*E. S.*

NATURAL-HISTORY BOOKS RECENTLY PUBLISHED.

The Aquarian Naturalist: a Manual for the Sea-side. By THOMAS RYMER JONES, F.R.S., Professor of Natural History and Comparative Anatomy in King's College, London, &c. London: John Van Voorst, Paternoster Row. 1858.

The work is most agreeably and popularly written. It contains 524 pp. fcap. 8vo., and 8 plates, printed in colours by the process called chromolithography. It treats only of salt-water objects, and a second volume by the same author is advertised as shortly to be published, similarly illustrated, intituled 'The Freshwater Series of the Aquarian Naturalist; being the Natural History of the Animal Inhabitants of our Streams and Ponds, adapted to the purposes of the Aquarium.' The price of the published work is 18*s*.

The Natural History of the Tineina. Vol. III., containing Elachista Part I., Tischeria Part I. By H. T. STAINTON, assisted by Professor ZELLER, J. W. DOUGLAS and Professor FREY. London: John Van Voorst, Paternoster Row. Paris: Deyrolle, Rue de la Monnaie, 19. Berlin: E. S. Mittler und Sohn, Zimmerstrasse 84, 85. 1858.

This volume is the third of a series, and written in four languages arranged in parallel columns,—English, French, German and Latin. It contains 270 pp., demy 8vo., and 8 plates, mostly drawn and entirely engraved by Mr. E. W. Robinson, and beautifully coloured. These plates leave nothing to be desired, and do great credit to the artists who have executed them. The price of the volume is 12*s* 6*d*.

A Catalogue of the Lepidopterous Insects in the Museum of the Hon. East India Company. By THOMAS HORSFIELD, M. and Ph.D., F.R.S., Keeper of the Company's Museum, and FREDERIC MOORE, Assistant. Vol. I. Printed by order of the Directors. London: W. H. Allen & Co., 7, Leadenhall Street. 1858.

The work is the first of a proposed series. It contains 280 pp. demy 8vo, and 18 plates, plain or coloured; these illustrate details of metamorphosis in a manner most acceptable to the entomologist. The price is 10*s.* plain, 20*s.* coloured.

The Life of Linnæus. By Miss BRIGHTWELL, of Norwich. London: John Van Voorst, Paternoster Row. 1858.

A brief and unassuming compilation. It contains 191 pp. ~~fcap.~~ 12mo, and an etched frontispiece. The price is 3*s.* 6*d.*

The Proceedings of the Zoological Society of London. With illustrations. 1858. Part I., January—March; Part II., March—April. London: Longman & Co., Paternoster Row. 1858.

Part I. contains 112 pp. demy 8vo, 9 coloured plates and 1 plain. Part II. contains 134 pp. demy 8vo, 7 coloured plates and 3 plain. The plates are beautifully executed from drawings by Wolf. The price of each part is 9*s.* 6*d.*

A Cyclopædia of the Natural Sciences. By WILLIAM BAIRD, M.D., F.L.S., British Museum, with Map and numerous Illustrations. London and Glasgow: Richard Griffin & Co., Publishers to the University of Glasgow. 1858.

This volume contains 613 pp. demy 8vo, a profusion of well-drawn and well-engraved wood-cuts, and a zoological chart, showing the distribution and range of animal life, in which the names of the carnivorous animals are printed in red and those of the herbivorous animals in blue,—a plan which catches the eye and conveys information to the mind rapidly and effectively. Between this map and the letterpress some slight discrepancies occur; thus the kangaroos or pouched rodents are coloured blue in the chart, as being herbivorous, while in the tabular view they appear as the fourth family of the order Feræ. The price of this very useful volume is 12*s.* 6*d*: it is marvellously cheap.

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Notices of New Books.—Natural-History Books recently Published, 6255.

The Red and Willow Grouse.—Mr. Gould, in a conversation about these birds, has this instant told me that the adult Lagopus Saliceti has *invariably* white wings: I am not at liberty to repeat any opinion Mr. Gould may have offered as to the distinctness of the two supposed species; but this mere matter of fact he permits me to use as I please: prior to attaining adult plumage the young birds' wings are coloured similarly in both grouse.—*Edward Newman; September* 27, 1858.

The Rev. J. C. Atkinson's paper on the Grouse will appear in the November number.

EDWARD NEWMAN, PRINTER, 9, DEVONSHIRE STREET, BISHOPSGATE, N.E.